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ABSTRACT

The past decade has seen a number of studies of how the poverty incidence (the percentage of families below the poverty line) of certain demographic groups changes in response to economic growth. The question of whether regional economic growth trickles down to rural and rural poor families was examined by statistically estimating the relationship between family income change and multicounty regional economic growth for a sample of 669 rural Wisconsin families with white, nonaged, nondisabled heads of household. These families, surveyed in 1968, were grouped according to farm poor, farm nonpoor, rural nonfarm (RNF) poor, and RNF nonpoor. Ordinary least squares regression was used to estimate the relationship between family income change and the two indicators of regional economic development (income growth and job growth) over the period 1965-67. The results indicated that poor farm families did not get a proportional share of additional regional income growth. Rural nonfarm nonpoor families appeared to be similarly unable to share proportionately in additional regional income growth. While farm nonpoor and RNF poor families did appear to respond somewhat to regional income growth, it appeared that, on the whole, additional regional income growth could be expected to widen the income gap between urban and rural families. (Author/NQ)

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TRICKLING DOWN: ARE RURAL AND RURAL POOR FAMILY INCOMES RESPONSIVE TO REGIONAL ECONOMIC GROWTH?

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Bruce A. Weber

August 1974

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ABSTRACT

The past decade has seen a number of studies of how the poverty incidence (the percentage of families below the poverty line) of certain demographic groups changes in response to economic growth. In the present study, the responsiveness of family income to regional economic growth is examined for a sample of rural and rural poor Wisconsin families with nonaged, nondisabled heads. Ordinary least squares regression is used to estimate the relationship between family income change over 1965-1967 and regional income and job growth over the same period.

The results indicate that poor farm families do not get a proportional share of additional regional income growth. Rural nonfarm (RNF) nonpoor families appear to be similarly unable to share proportionately in additional regional income growth. While farm nonpoor and RNF poor families do appear to respond somewhat to regional income growth, it appears that, on the whole, additional regional income growth can be expected to widen the income gap between urban and rural families.

The income changes of farm families (both poor and nonpoor) are sensitive to additional jobs in a region although the coefficients suggest that quite a large number of new jobs must be created in order to have much effect. RNF family income is quite sensitive to the unemployment rate which suggests that wage rate increases accompanying tight labor markets are a major component of income change for these families.

There appears to be no single regional development strategy which can be effective in improving the incomes of all rural families. Different groups of rural families respond to different components of regional growth.

Development programs emphasizing job growth would probably improve farm family incomes much more than those of RNF families. Programs to tighten labor markets, raise the minimum wage or stimulate regional demand would be expected to help the RNF families (and farm nonpoor families to some extent) but would have little effect on the incomes of poor farm families.

TRICKLING DOWN: ARE RURAL AND RURAL POOR FAMILY INCOMES RESPONSIVE TO REGIONAL ECONOMIC GROWTH?

Bruce A. Weber

During the past decade, a number of economists have addressed the question of the responsiveness of poverty incidence to economic growth, that is, how the percentage of families in poverty changes with economic growth. Empirical research has concentrated on estimating the elasticity of poverty of various subgroups of the population with respect to economic growth. A demographic group is considered responsive to economic growth if the elasticity for that group is greater than unity, that is, if poverty incidence for that group declines by more than one percent for each percentage increase in national income (or national product). Economic growth is considered to "trickle down" to the poor in groups whose poverty elasticity is greater than one.

Responsiveness of Poverty vs. Responsiveness of Poor Family Income

This "trickle down" literature [1,2,5,6,7,10,12] has identified demographic groups whose poverty incidence appears to be responsive to economic growth: nonfarm families, families headed by nonaged persons, and male-headed families. While the evidence on differences between races is mixed, the poverty of whites appears to be more responsive than that of racial minorities. One implication which is often drawn from these findings is that poor families in these groups are "reached" by the trickle down of economic growth, that the incomes of the poor families in these groups increase in response to economic growth.

It is clear, however, that responsiveness of poverty incidence does not necessarily imply responsiveness of the incomes of poor families. Economic growth could reduce poverty incidence merely by reducing the number of families who fall into poverty while having no effect on the number of poor families who escape poverty each year.

Growth might well have no effect on the average income changes of poor families. In such a situation, poor families (presumably the target population of those concerned about growth and poverty) would be unaffected by economic growth even though poverty incidence declined due to economic growth. While the poverty of white, nonaged, or nonfarm families may be responsive to economic growth, the incomes of poor families who are white nonaged or nonfarmers may not be responsive, as has been assumed.

A critical relationship which has been ignored in the trickle down literature, therefore, is the relationship between the incomes of poor families and economic growth: how responsive are the incomes of poor families (and especially the incomes of the most "reachable" poor families whose heads are white, nonaged, male or not farm operators) to economic growth?

Regional Growth and the "Reachable" Rural Poor

Although the rural poor have not been studied as a separate demographic group with respect to their responsiveness to economic growth, there are several factors which argue for such a study. First, although only 26.8 percent of the families in this country are rural, well over one-third of the poor families (38.0 percent) in the U.S. live in rural areas [18, Table 95]. There is then a particular urgency to find ways of improving the incomes of rural poor families.

At the same time, however, rural residents are generally assumed to be on the periphery of the economy, attached weakly if at all to economic growth nodes. There is thus a higher probability that current anti-rural poverty strategies, based on the notion that growth will trickle down to the rural poor, will be ineffective.

The question of the responsiveness of the poor to economic growth is commonly framed with respect to the national economy. It is questionable whether this is appropriate for making general judgments about their economic sensitivity, especially for rural families with their presumed tenuous attachment to the economic main-stream. Whereas rural poor families might not show responsiveness to national growth, they might be highly sensitive to changes in the economy of their immediate region. While policymakers have an interest in the responsiveness of the poor to both national and local or regional trends, knowledge of responsiveness to local area growth is particularly important in view of the current emphasis on regional growth as an anti-poverty weapon.

The notion that regional growth is beneficial to the rural poor has been popular for many years in both government circles and the academic community. The Appalachian Regional Commission was created on the assumption that the rural poor would respond to regional economic growth. The same premise was implicit in the subsequent creation and funding of the other regional commissions. Two of the criteria which an area must meet in order to be considered for designation as an "Economic Development Region" are that the area has substantial unemployment and low median family income. While the

primary concern on the regional commissions seems to be the economic health of the regions and not of poor families as such, the reduction of poverty through regional growth (hence increased employment) is one of the subsidiary goals of the commissions and is implicit in many of their criteria for selecting projects [see, for example, 23].

The idea that regional development has an essential role to play in reducing rural poverty was underscored by the President's National Advisory Commission of Rural Poverty. In its final report The People Left Behind the Commission devoted a full chapter to recommendations about the need for area and regional development as a part of an anti-poverty strategy [13, Chapter 10].

The popularity of regional growth approaches to rural poverty and the prospect of new infusions of money into rural areas as a result of recent rural development legislation have made the lack of empirical evidence about the impact of regional growth on the rural poor more critical. The present study is an attempt to provide an empirical base from which to make judgments about the effectiveness of regional growth in raising incomes of the rural poor and to answer the question: Given the present distributions of resources, to what extent are short-run income changes of rural and rural poor families responsive to additional economic growth in their immediate laborsheds?

The Empirical Model

The question of whether regional economic growth trickles down to rural and rural poor families is examined in the present study by statistically estimating the relationship between family income change and multicounty regional economic growth for a sample of 669 rural and

rural poor Wisconsin families with white nonaged, nondisabled heads. These "reachable" rural families (who presumably have the greatest capacity to respond to additional growth) were surveyed in 1968 with respect to their recent economic adjustments, and in particular with respect to their income changes over the period 1965-67.[1]

Family Income Change. Family income change over the 1965-67 period is used as the dependent variable in the analysis. It is viewed conceptually as being at least partially a response to increases in opportunity available to the families, as measured by two indicators of regional economic development: income growth and job growth. Both indicators measure different aspects of the opportunity available to families. Each measure, however, has unique characteristics which make it appropriate for the purposes of this study and thus both are used here as independent variables.

Regional Income Growth. Income growth is a more complex measure of development than job growth because it captures not only increases in resource use, but also increases in factor productivity and increases in factor and product prices. It has the advantage, however, of being in the same units ($) as family income change which permits the examination of the share of regional income accruing to different groups, and especially to the poor. This latter characteristic makes it possible to construct and test a variant of the "trickle-down" question: do rural poor families get a share of additional regional income growth which is proportional to their numbers?

Regional income growth is defined in this study as the "change in regional Effective Buying Income per household between 1965 and 1967."

Effective Buying Income (EBI) is an estimate of after-tax cash income (plus an imputed value for rental income "earned" by homeowners and for the cash value of homegrown food consumed) which is published each year for every county in the country by Sales Management Magazine. The regional income growth variable used in the regressions was estimated by summing the EBI estimates for 1965 and 1967 [14,15] over all counties in each region and dividing this sum for each year by Sales Management's estimate of the number of households in the region for that year. The difference between the 1965 and 1967 estimates of regional EBI per household is used as the predictor variable. Brian Berry's operationalization of the concept of a Functional Economic Area [3, pp. 28-29] was slightly modified in grouping the Wisconsin counties into multicounty regions.

Regional Job Growth. Regional development programs often highlight job growth as a program objective both because of the public visibility of new jobs and because of the amenability of job growth to program cost effectiveness evaluations. Little is known, however, about the impact of additional jobs on the incomes of different groups. It is not known, for example, what is the impact of additional jobs on the incomes of rural poor families. Because estimates of the impact of additional jobs on rural and rural poor family incomes would presumably be useful in the evaluation of those public programs in which regional job growth is an objective, rural family income changes are related to regional job growth in the present study as well as to regional income growth.

Regional job growth is defined as the "change in the number of regional jobs per household over the 1965-1967 period." It represents the change in the opportunity to get a job which was available to each

household and was computed using County Business Pattern estimates of the number of employees[2] in each county during the mid-March pay period of the relevant year [20,21]. For each year, the sum of all employees in the region was obtained and this figure was divided by the Sales Management Survey of Buying Power estimates of regional households used in computing the previous variable, to obtain the estimate of the number of jobs per household in the region. The change variable used as the predictor in the regressions is the difference between the 1967 and 1965 estimates.

Ordinary least squares regression was used to estimate the responsiveness of rural family income to additional regional income and job growth. Two sets of regressions were run, one with each of the measures of regional economic growth as the main predictor variable.

The Groupings of "Reachable" Rural Families. For each regional growth measure, four separate regressions were run, one each for farm poor, farm nonpoor, rural nonfarm (RNF) poor, and RNF nonpoor families. In each case, family income change for 1965-67 was regressed on the appropriate estimate of regional growth for 1965-67. The separation into subgroups was made because it was expected that different forces are important in determining the income changes of these families and that response to common variables would differ between subgroups. Families were considered farm families if the head operated a farm in 1965, and were considered RNF otherwise. Families were classified as "poor" if their 1965 income placed them in the lowest 20 percent of the 1965 income ranking of families in the sample. Variables were introduced in each regression to correct for suspected nonrandomness of the sample and to assure unbiased estimates of the regional growth coefficients.[3]

The Major Questions

The regional income growth coefficient estimates are used to determine, first, whether the incomes of rural and rural poor families show any response at all to additional growth and then whether rural and rural poor families get a proportional share of additional growth.

There are three principal null "hypotheses"[4] with respect to regional income growth: (1) that rural and rural poor family income does not respond at all to additional growth; (2) that growth does trickle down to the rural poor; and (3) that the rural nonpoor do get their share of additional economic growth. A group will be considered responsive in the present context if its family income change increases at all in response to additional regional income growth: if the regression coefficient is greater than zero. Growth will be considered not to trickle down if the poor get a share of additional growth which is less than proportionate to their numbers in the region: if the coefficient is less than unity. Similarly, the rural nonpoor will be judged not to get their "share" of additional growth if they do not share proportionally in additional regional income growth: if the regression coefficient is less than unity.[5]

The regional job growth coefficient estimates are used simply to test the hypothesis that the income changes of the four groups of rural families are not responsive to regional job growth.

Regional Income Growth and Rural Family Income Change: The Empirical Evidence

The results of the regressions of regional income change on family income change for each subgroup are summarized in Table 1. Because of the large number of variables included in each regression as control variables, the estimates are imprecise, as is clear from the size of

TABLE 1. Regression Results: Responsiveness of Rural Family Income to Regional Income Growth

	Regression Coefficient	Standard Error of the Regression Coefficient	Number of Observations
Farm Poor	-.33	1.04	65
Rural Nonfarm (RNF) Poor	+.78	.89	92
Farm Nonpoor	+.93	.91	144
RNF Nonpoor	+.05	.63	368
			669

the standard errors relative to the regression coefficients. The regression coefficients, however, are theoretically unbiased, and thus represent the best available estimates of the responsiveness of "reachable" rural family income to regional economic growth.

The regression coefficients represent the change in family income change associated with a one dollar increase in regional income change per household. These coefficients must be interpreted with considerable care. Both the dependent variable (family income change) and the independent variable (regional income growth) are change variables. Regression coefficients are commonly interpreted as the "expected change in the dependent variable which is associated with a one unit change in the independent variable." In a cross-sectional analysis with point-in-time variables (if, for example, a rural family income were regressed on regional income), the regression coefficients would represent the "expected change in rural family income associated with a one unit change in regional income." In the present study, however, in which rural family income change is regressed on regional income change, the coefficients represent the "expected change in family income change which is associated with an additional one unit change in regional income (i.e., with a one unit change in regional income change)."

This change variable formulation is particularly well adapted to making inferences for government policy or program purposes since the coefficients are directly interpretable as the effect on rural family income change of additional job or income growth. It is precisely the effect of increments to regional economic trends that policymakers

must know about since regional development programs are viewed as incremental to existing trends.

Poor farm families and nonpoor RNF families appear to be singularly unresponsive to additional regional income growth. The regression coefficients for these groups are -.33 and .05 respectively. If these estimates are correct this implies that for each additional $100 per household of regional income change, the farm poor could expect their average income change to be $33 lower. Similarly, the RNF nonpoor could expect only an additional $5 in family income for each additional $100 in regional income growth.

While RNF poor families and nonpoor farm families appear to be quite a bit more responsive (with regression coefficients of .78 and .93 respectively), it is noteworthy that none of the coefficients is greater than unity. This implies that, if the coefficients are correct, rural families do not share proportionately in regional economic growth, that in fact their linkages to the regional economies in which they operate are weaker than the linkages of their urban counterparts. This suggests that, while additional regional growth may improve the incomes of some rural families (especially the RNF poor and farm nonpoor), it will at the same time probably increase the income gap between rural and urban families.

Regression coefficients, taken alone, however are not adequate for making inferences from data. It is important to consider also the precision of the estimates and to attach probability statements to inferences. In the previous section, three hypotheses were outlined

coefficients, the hypotheses can be tested in one-tail tests. With 80 percent confidence intervals, for example, the one-tail test can be performed with a confidence level of .10. Figure 1 specifies the hypotheses and identifies the rejection regions for the one-tail tests.

The confidence intervals and conclusions about the hypotheses are summarized in Table 2.[6]

For the farm poor, the 80 percent confidence interval of the regional growth coefficient (-1.65 to +.99) includes zero but excludes unity. One cannot reject the hypothesis that the farm poor do not respond at all to regional income growth, but one can conclude (with less than a 10 percent probability of error) that the farm poor do not get a share of regional income growth which is proportional to their numbers. Regional economic growth does not appear to trickle down to the farm poor.

The 80 percent confidence interval for the RNF poor includes both zero and unity. Neither hypothesis can be rejected for the RNF poor at the .10 level. The responsiveness null hypothesis can be rejected however at the .20 level: the 60 percent confidence interval for the rational growth coefficient (+.02 to +1.54) includes unity but excludes zero. There is thus an 80 percent probability that the RNF poor do respond positively to additional regional income growth.

Likewise for nonpoor farm families the 80 percent confidence interval includes both zero and unity. However the 60 percent confidence interval (+.15 to +1.69) includes unity but excludes zero. One can again conclude that the farm nonpoor do respond to additional regional income growth, but it is not possible to determine whether they get more or less than their proportionate share.

FIGURE 1. The Principal Hypotheses and Tests of their Validity

Null Family Income Responsiveness Hypothesis: Rural families (poor and nonpoor) do not respond at all to additional regional income growth	
Do not reject Hypothesis of no Family Income Responsiveness if any part of the confidence interval falls in this region	Reject Hypothesis of no Family Income Responsiveness if confidence interval falls entirely within this region

Value of Regression Coefficient: 0 — 1.0

Reject Trickle Down Hypothesis if confidence interval falls entirely within this region	Do not reject Trickle Down Hypothesis if any part of the confidence interval falls in this region
Reject Hypothesis that rural nonpoor get a proportionate share of additional regional growth if confidence interval falls entirely within this region	Do not reject Hypothesis that the rural nonpoor get a proportional share of additional regional growth of any part of the confidence interval falls in this region

Trickle Down Hypothesis: Rural poor families get a proporational share of additional regional income growth; growth does trickle down to the rural poor.

Rural Nonpoor "Proportional-Share" Hypothesis: The rural nonpoor get a proportional share of additional regional income growth.

TABLE 2. Confidence Intervals and Conclusions about Hypotheses

	Regression Coefficient	80 percent Confidence Interval	60 percent Confidence Interval	Conclusions
Farm Poor	-.33**	-1.65 to +.99		Reject Trickle Down Hypothesis at .10 level
Rural Nonfarm (RNF) Poor	+.78*	-.37 to +1.93	+.02 to +1.54	Reject Hypothesis of No Responsiveness at .20 level
Farm Nonpoor	+.93*	- .24 to +2.10	+.15 to +1.69	Reject Hypothesis of No Responsiveness at .20 level
RNF Nonpoor	+.05**	- .75 to +.85		Reject Hypothesis that Rural Nonpoor get proportionate share of additional growth at the .10 level.

*Significantly different from zero at .20 level in a one-tail test.

**Significantly different from 1.0 at .10 level in a one-tail test.

For the RNF nonpoor families, the 80 percent confidence interval (-.75 to +.85) includes zero, but excludes unity. While it is not possible to draw any inferences regarding responsiveness from this result, one can conclude that there is a 90 percent probability that the RNF nonpoor do not get a proportionate share of additional regional income growth.

Why the RNF poor and farm nonpoor appear to be more responsive to additional economic growth than the farm poor and RNF nonpoor is unclear. One might speculate that it is the RNF poor and farm nonpoor who are most sensitive to nonfarm labor market upturns. They are more likely to be unemployed than the RNF nonpoor and more likely to be employable and interested in wage employment than the farm poor. The extensive participation of the farm nonpoor in nonfarm labor markets and the lack of participation by the farm poor in these markets has been documented [16]. This speculation is reinforced by evidence presented below.

Regional Job Growth and Rural Family Income Change: The Empirical Evidence

Because new jobs are the explicit objective of many regional development efforts and because little is known about the effect of new jobs on the incomes of the rural poor, estimates were made of the relationship between regional job growth and the income changes of the four groups of rural families.

Job Growth. Family income change was regressed on regional job growth and a number of control variables[7] for the four groups of families. The results are used to test the one-tailed hypothesis that family incomes for a given group do not respond positively to additional job growth. The results are reported in Table 3.

TABLE 3. Regression Results: Responsiveness of Rural Family Income to Regional Job Growth and Unemployment Rates

	Regional Job Growth Regression Coefficient (Standard Error)	80 Percent (60 Percent) Confidence Interval of Coeffi-cients	Regional Unemploy-ment Rate Regression Coefficient (Standard Error)	80 Percent Confidence Interval of Coeffi-cients
Farm Poor	95.8* (82.5)	-10 to +201 (+26 to +166)	-3.12 (3.15)	-7.11 to +.87
RNF Poor	1.2 (62.0)	-88 to +91 (-51 to +54)	-3.24** (2.38)	-6.28 to -.20
Farm Nonpoor	88.7** (55.4)	+18 to +160 (+42 to +136)	-1.57 (2.91)	-5.30 to +2.18
RNF Nonpoor	8.0 (42.2)	-46 to +62 (-28 to +44)	-4.01** (1.97)	-6.53 to -1.49

*Significant at the .20 level in a one-tail test.

**Significant at the .10 level in a one-tail test.

Farm families appear to be much more sensitive to changes in the number of jobs in their immediate regions than do RNF families. It is possible to reject the hypothesis of no positive relationship between regional job growth and family income change for poor farm families at about the .13 level. While the 80 percent confidence interval (-10 to +201) includes zero, the 60 percent confidence interval does not. If the computed value of 95.8 is the true value, an increase of .01 jobs per household over the "normal" increase would increase the incomes of poor farm families $96 above what they would get under "normal" conditions.

The result for nonpoor farm families, significant at the .06 level, suggests that nonpoor farm families are just about as responsive to regional job growth as their poor farm neighbors. The computed value of the coefficient is 89, and 80 percent confidence interval is bounded by +42 and +136. If the calculated value is the true value, an additional .01 jobs per household in a region would be associated with an additional increase in the incomes of nonpoor farm families of $89.

RNF families do not seem to respond linearly to changes in the number of jobs in a region. It is not possible to reject the hypothesis of no positive linear relationship between regional job growth and family income change at any reasonable level of significance for these families.

Unemployment Rate. Economic theory suggests an inverse relationship between the unemployment rate and family income change, ceteris paribus. Holding job growth constant, one would expect that the lower the unemployment rate, the higher the rate of increase in the wage rate (hence family income change). The regional unemployment rate coefficient for each of the

groups of rural families was examined to test the hypothesis that the coefficient was less than zero, i.e., the hypothesis of an inverse relationship.

For RNF poor families, the coefficient of unemployment rate variable has a value of -3.24 and is significant at the .09 level in a one-tail test. For the RNF nonpoor, the coefficient was even larger (-4.01) and more significant (at the .01 level). This result is highly plausible both in magnitude and sign. The income changes of farm families, by contrast, are unrelated to the level of unemployment.

The differential sensitivity of farm and nonfarm families to the regional unemployment rate is interesting in view of the above finding about the differential responsiveness of farm and nonfarm families to regional job growth. Farm family income change is responsive to additional job growth whatever the unemployment rate. RNF families, however, appear to be insensitive to additional job growth, their income changes being dependent significantly on the level of unemployment. This result has considerable appearl, and is consistent with observed labor market participation in the two groups.

The income changes of farm families (who, by definition, are not fully employed in wage work and are often underemployed on the farm) would be expected to be more sensitive to job growth than to the unemployment rate. Job growth means new opportunities for increasing family income; high unemployment merely means trying to squeeze the small marginal return from farm resources already utilized near capacity. RNF families, on the other hand, are much more dependent on the labor market. High unemployment leaves some of them without significant other sources of income, and others with their only income source (wages) rising at a slower rate.

Job Growth-Unemployment Rate Interaction. There is literature which suggests a differential responsiveness of poor and nonpoor workers to overall economic conditions: specifically that labor force participation of the poor depends significantly on the unemployment rate, whereas that of the nonpoor is insensitive to this measure of overall economic conditions.

Cohen et al. [8, pp. 42-46] found that the labor force participation rate of prime-age male heads of families is not responsive to the unemployment rate. The results of a study by Mooney [11], however, seem to suggest that the participation rates of the urban poor are quite sensitive to unemployment rates. Mooney concluded from his study of labor participation in urban census poverty tracts that in areas of high unemployment there was a "discouraged worker effect;" his "discouraged worker" hypothesis is that as area unemployment rises, labor force participation of marginal (i.e., poor) urban workers decreases as these workers become discouraged and withdraw from the labor force.

Mooney's findings suggest a corollary hypothesis in the context of the present study: discouraged workers are not as likely to be responsive to additional job growth as those who are not discouraged. Hence the income changes of poor families in periods of high unemployment are likely to be lower in response to a given increment to job growth than those of poor families in periods of low unemployment. A second hypothesis suggested by the differences between the results of Mooney and those of Cohen et al. is that the responsiveness of the nonpoor to additional regional job growth does not depend on the unemployment rate. These hypotheses imply that the effect of the unemployment rate on family income change is not linear, but rather that unemployment interacts with job growth in its effect on family income change.

In order to test these hypotheses for rural families, a multiplicative interaction term (regional unemployment rate in 1965 times change in the number of jobs per household in the region over the 1965-67 period) was added to each of the basic regressions reported in Table 3. If the "dampened responsiveness" corollary of the discouraged worker hypothesis is true (i.e., if the rural poor have lower income changes in response to any given addition to job growth in regions of high unemployment than in regions of low unemployment), then the coefficient on the interaction term will be negative for poor families. If the sensitivity of the poor to additional job growth is more dependent on the regional unemployment rate than that of the nonpoor (the second hypothesis), then the interaction term coefficient will be larger for the poor than for the nonpoor.

The results for rural poor families do not support the "dampened responsiveness" hypothesis stated above: the responsiveness of rural poor families to additional regional job growth does not appear to depend on the regional unemployment rate. The coefficients of the interaction terms are not significantly different from zero at even the .50 level.

There is, however, strong evidence that the sensitivity of nonpoor rural families to additional job growth depends on the unemployment rate. Whereas the observed responsiveness of the poor farm families in the sample is apparently not dampened by high unemployment rates, the responsiveness of nonpoor farm families is dampened.

The interaction term for nonpoor farm families is both highly significant and negative. The result, reported in Table 4 is significant at the .01 level; it suggests that an additional .01 jobs per household in a region with a 5 percent unemployment rate will be associated with a $582

TABLE 4. Regression Results: Interaction between Regional Job Growth and Regional Unemployment in Their Effect on Family Income Responsiveness

	Regression Coefficient	Standard Error Coefficient	t-ratio
NONPOOR FARM FAMILIES			
Regional Job Growth	1181	522	2.27
Regional Job Growth/ Unemployment Rate Interaction Term	-291	138	-2.11
Regional Unemployment Rate	24.4	12.6	1.94
NONPOOR RNF FAMILIES			
Regional Job Growth	-363	353	-1.03
Regional Job Growth/ Unemployment Rate Interaction Term	99	93	1.06
Regional Unemployment Rate	-13.1	8.8	-1.49

lower income change for nonpoor farm families than would a similar increase in jobs in a region with a 3 percent unemployment rate. Indeed, for unemployment rates above 4 percent, an additional increase in jobs above trend will be accompanied by a lower income change for these families than would happen in the case of "normal" growth. This would imply that the existence of a "dampened responsiveness" effect, in periods of high unemployment, nonpoor farm families will not enter the nonfarm labor market in response to an increase in the number of jobs in the region. In periods of low unemployment, however, the response of these families to an increase in regional jobs is quite impressive; with the unemployment rate at 3 percent, an additional increase of .01 jobs per household in the region will be associated with an addition to nonpoor farm family income change of almost $300.

There is weaker evidence in Table 4 of interaction in the case of RNF nonpoor families. Because the result is only significant at the .30 level (in a two-tail test), one would ignore it if one were truly testing hypotheses instead of developing them. The result does, however, fit into a pattern; it indicates that additional jobs in a region are most <u>beneficial</u> to RNF nonpoor families in periods of <u>higher</u> unemployment, and that additional jobs in periods of low unemployment are accompanied by lower than "normal" family income changes, for these families.

If the interaction term and job growth coefficinets are the true coefficients, this would imply that the effect of .01 additional jobs in areas where the unemployment rate is 5 percent would be an additional $135 of income change for these families; in areas where the

unemployment rate is 3 percent, however, the addition of a .01 jobs per household to the "normal" increase would be accompanied by a $65 lower income change than would be the case under "normal" growth conditions.

This would seem to suggest the perception of a "normal" growth threshold by families not in this group: under conditions of relatively full employment additional growth draws into the labor force a reserve pool of labor from other groups of families which would not participate in the labor force under "normal" growth conditions: the entrance of this reserve either takes jobs which RNF nonpoor families would have gotten under "normal" growth conditions or keeps wages and salaries from rising as fast as they would have under "normal" growth conditions. Under adverse labor market conditions, however, the additional jobs do not draw workers from other groups of families into the labor force. The better qualified RNF nonpoor family members (whose responses are not dampened) obtain the additional jobs and their families experience additional income change.

It is possible to hypothesize on the basis of these results that (1) rural poor family responsiveness to regional job growth does not seem to depend on the unemployment rate; (2) the responsiveness of nonpoor farm families to additional job growth appears to be dampened by high unemployment rates but is encouraged by tighter labor markets; (3) RNF nonpoor families are quite responsive to regional job growth under conditions of high unemployment, but are not so favorably impacted by job growth in periods of fuller employment. This latter result would tend to confirm the existence of discouraged responders among other (e.g., farm) groups of families.

Summary. The results with respect to the responsiveness of rural families to regional job growth may be summarized as follows: (1) Farm families (both poor and nonpoor) appear to be quite responsive to regional job growth, whereas for RNF families there appears to be no linear relationship between family income change and regional job growth; (2) likewise, the regional unemployment rate affects the responsiveness only of the nonpoor rural families, farm nonpoor families showing "dampened responsiveness" in the face of high unemployment and RNF nonpoor families appearing relatively more disadvantaged under conditions of full employment.

How Does Regional Economic Growth Affect the Income Changes of Rural Families?

Regional income growth, as was noted above, is a complex measure, an aggregate index which captures increases in wages, profits, rents, factor productivity, hours worked per week in existing jobs, weeks worked in existing jobs, and increased weekly hours and weeks due to new jobs. Looking just at wage income, there are three possible sources of increase in regional wage income: increased wage rates, increased weekly hours or weeks worked in existing jobs, and new jobs. The results summarized in Table 5 indicate possible major components of regional wage income growth which affect the family income responsiveness of each of the four groups of rural families.

The evidence about the effect of regional job growth on family income change appears to contradict results about the effect of regional income growth. Table 5 indicates a plausible reconciliation of the apparently contradictory evidence.

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TABLE 5. Summary of Regression Results: The Responsiveness of Rural Family Income to Regional Economic Growth

	Effect of Additional Income Growth	Effect of Additional Job Growth	Effect of Unemployment	Probable Major Growth Component Affecting Family Income
Farm Poor	0	+	0	New Jobs
RNF Poor	+	0	-*	Increased Hours/Weeks Worked in existing jobs Increased wage rates
Farm Nonpoor	+	+*	0	New Jobs Increased Hours/Weeks Worked in existing jobs
RNF Nonpoor	0	0	-**	Increased wage rates

All tests are one-tail tests.

0 indicates no relationship
+ indicates positive relationship significant at .20 level
- indicates negative relationship significant at .20 level

*indicates result significant at .10 level.

**indicates result significant at .01 level.

The sensitivity of the farm poor to job growth but not to the other measures of the regional economic situation suggests that the farm poor do not enter the wage labor market unless there are new jobs. Since the farm poor in Wisconsin do not receive much wage income (only about 15 percent of their income is from wages[8] [16, p. 32]), they are obviously not active in the wage labor market. One would not expect their incomes to respond to wage rate increases or overtime opportunities.

The RNF poor, on the other hand, receive a greater though not a major percentage of family income from wage sources [16, p. 38]. They are more likely to be underemployed in wage jobs than the other groups and are less likely to have other (self-employed) alternative income sources. If they do in fact hold wage jobs but are not fully employed in these jobs, then one would expect them to benefit from the increased "hours and weeks worked in existing jobs" component of regional growth and to a lesser extent from wage rate increases.

The observed responsiveness to income growth of this group and their lack of responsiveness to job growth supports the notion that their income changes occur primarily through increases in weekly hours and number of weeks worked in existing wage jobs. Furthermore, since in periods of fuller employment, wages are liable to rise more quickly than in slack periods, increasing the income changes of those presently employed (or underemployed), the significant negative effect of unemployment suggests that the RNF poor get some benefit from the wage rate increase component of regional growth.

Since nonpoor farm families in Wisconsin earn almost half their income from wage and nonfarm business services [16, p. 32], and since they presumably have the resources to make farming a real option, one would expect that this group of families would be in a position to

benefit from all the components of regional growth. To the extent that they have wage jobs they would be able to increase their incomes by increasing hours and weeks of work available to them in a growing region as well as by getting the benefits of higher wages. To the extent that they do not have wage jobs, they would presumably have both the initiative and the qualifications to get some of any new jobs which are created. Since the poor often have fewer skills, the nonpoor farm families would be more likely than the poor to get these new jobs. The observed responsiveness of these families to regional income and job growth supports this line of reasoning. The observed interaction between regional job growth and the unemployment rate is also consistent with the notion that nonpoor farm families have more options than others: they can enter the job market when they are more likely to get jobs (in periods of low unemployment) and farm during periods of high unemployment when they are less likely to get jobs.

While they may also benefit significantly from wage rate increases accompanying growth, the lack of significant relationship between the unemployment rate and the income changes of these families suggests that wage rate increases are not as important to them as the other two components.

The RNF nonpoor, finally, do not appear to respond to additional job or income growth. Since one would expect unemployment and underemployment to be less prevalent in this group than the others, it is quite plausible that new jobs and increased weeks and hours would not go primarily to this group. The income changes of these families, however, are highly sensitive to the unemployment rate: in tight labor markets, their income changes are significantly higher. This suggests

that the primary way in which regional economic conditions affect the income changes of these families is through wage rate increases--which are higher the lower the unemployment rate.

Conclusions and Policy Implications

There appears to be no single strategy which would be effective in raising the incomes of rural families. Different groups of rural families appear to respond to different components of regional growth.

These results, taken together, suggest that additional regional job growth can be expected to increase the incomes of the farm poor and that it is increases in hours or weeks worked and wage rates that are likely to improve the income situation of the RNF poor. The results further suggest that the farm nonpoor appear to be able to take advantage of increased growth better than any of the other groups of rural families, and that they benefit most from additional new jobs in periods of low unemployment. The RNF nonpoor appear to be insensitive to additional job growth, although they experience the highest income changes in tight labor markets; presumably through increases in the wage rate.

Rural development programs emphasizing job growth might be beneficial to farm families, but would not affect rural nonfarm families except through their impact (probably minimal because of the responsiveness of farm families) on the unemployment rate. Programs to tighten labor markets or raise the minimum wage might help RNF families but not farm families. Programs to increase demand (and more fully utilize underemployed labor) would have most impact on the RNF poor and farm nonpoor.

It is clear, however, that creating enough additional jobs to have a significant impact on the income of even those rural families whose incomes are most sensitive to job growth would be quite expensive.

Creation of an additional .01 jobs per household in La Crosse or Appleton-Oshkosh, over a two year period, for example, would require an additional 500 jobs in La Crosse or 1000 jobs in Appleton-Oshkosh. Since the observed change in jobs over the period 1965-67 was about 3000 jobs in the La Crosse region and 5000 jobs in the Appleton-Oshkosh region, an increase of 500 or 1000 additional jobs means increasing job growth by almost 20 percent. Tweeten has estimated that each job created by regional development type programs costs at least $20,000 in public funds [17, p. 52]. For La Crosse, in the above example, creating an additional .01 jobs per household would require a $10,000,000 expenditure in this six-county region over a two-year period. While the estimates presented here are imprecise, they suggest that this expenditure would probably increase the incomes of the "reachable" poor farm families by less than $100 on the average over a two-year period. Since there are probably less than 1600 poor farm families in the entire La Crosse region, it would cost the public approximately $6,250 for every $1 increase in income to the farm poor.[9]

Rural families appear to be, as has been presumed, on the periphery of regional economic activity. The fact that some are responsive to additional regional growth means that they are attached to economic growth nodes. However, additional regional growth appears to accrue primarily to urban families, with rural families generally getting less than their proportionate share.

To the extent that regional development programs are justified as measures for improving the incomes of rural families, the evidence presented here would suggest that they are not likely to be very cost-effective in achieving this objective, and that even where they are effective they are likely to widen the income gap between rural and urban families.

FOOTNOTES

*Lee Bawden provided guidance and insightful comment at every stage in the development of this paper, although he is not implicated in any remaining errors. The research was supported by the Institute for Research on Poverty, University of Wisconsin, Madison and is based on the author's unpublished Ph.D. dissertation [24].

[1]Details of the survey (e.g., a questionnaire, sampling procedure) and a one-way frequency distribution of results is available in [4].

[2]County Business patterns reports the paid civilian wage and salary employment covered by social security, excluding those government (state and municipal) employees who are covered. In addition, County Business Pattern figures exclude self-employed persons (who represent 10 percent of paid civilian employment) workers in agriculture (farmers and farmworkers), those in domestic service and railroad employment. Nationwide, County Business Patterns is estimated to report about 76 percent of all paid civilian wage and salary employment [21, p. iii]. Full-time and part-time jobs are reported together with no indication of what proportion of jobs is not full-time.

[3]Two "regional" variables were introduced on theoretical grounds to assure unbiased coefficients. The regional unemployment rate in 1965 was introduced into both the income growth and job growth regressions because the income responsiveness of families (and especially poor families) to growth is thought to depend on the unemployment rate. The effect of a given number of new jobs on family incomes is likely to be less in periods of high unemployment than in periods of low unemployment. This is likely to be true for both the unemployed (who are likely to be discouraged about entering the labor market in bad times) and the employed (whose wages will not rise as fast in a labor-surplus market). An indicator of the importance of farming in the region (percent of the region's families engaged in farming) was included in the regional income growth regressions to control for differential effect on family income changes, at a given regional income growth rate, of differing proportions of regional growth being due to farm price changes.

Sixteen variables related to the individual family's ability to respond to regional income and job growth were included in each regression: family location with respect to a central county, age of head, education of head, head partially disabled in 1965, head became disabled over 1965-67, education of spouse, spouse became disabled 1965-67, five variables describing sex and marital status of the head and changes in marital status between 1965 and 1967, number of potential earners, number of children, net worth, and variables indicating whether the head took his first job or retired between 1965 and 1967.

The inclusion of these sixteen variables in all of the regressions, while unnecessary theoretically, was needed because the sample was not drawn in such a way as to insure a random sample of each region. The variables were included to insure that nonrandom distribution of family characteristics among regions did not bias the estimates of the regional growth coefficients. Including these variables eliminated the

3 (cont.)
possibility that an effect on family income change which was due to nonrandom distribution of families by age of head in the sample, for example, would be attributed to regional growth.

For a more complete discussion of the control variables and the rationale for including them, see [24, pp. 89-105].

[4]The term "hypothesis" suggests a testable proposition derived from economic theory. Such a definition of "hypothesis" is not applicable with reference to the distribution of income growth because of the effective lack of any theory on this subject. The term "hypothesis" is used here, then, as it has been in other "trickle down" studies to mean an "empirical question" about how growth is distributed among rural families.

[5]The second and third hypotheses differ only in that the second applies to the rural poor while the third applies to the rural nonpoor. Both test the hypothesis that rural families participate proportionally in regional economic growth. It is only when applied to the poor however that this hypothesis is called a "trickle-down hypothesis."

[6]In testing rigorously specified hypotheses derived from standard theory, it is customary to report only those results which are significant at the .01 and .05 levels. These significance levels may be regarded as unduly restrictive for the initial stages of investigation. Given the need for so many control variables, .10 and .20 significance levels were considered adequate for the preliminary search for relationships which this study represents. As noted above, economic theory provides no hypotheses on the questions dealt with here. Thus the formal terminology of the scientific method ("reject hypothesis at .10 level") is to be taken in context: as an indication of the degree of confidence which can be placed in some empirical results which generally have no theoretical basis.

[7]See footnote 3.

[8]This figure applies to multiple earner families--including the aged and disabled which are excluded from the present.analysis. It also excludes single earner families which are included in the present study. Since aged and disabled receive mostly transfer income, the inclusion of the aged and disabled in the 15% estimate would be expected to underestimate the relative importance of wage income for "reachable" poor farm families. Also strictly speaking, "wage income" is defined in the survey as "wage and nonfarm business income." The nonfarm business component, however, is not expected to be significant for the poor.

[9]Even using the conservative Department of Commerce estimates of $3200 public cost per full time job equivalent [22], public cost of increasing the incomes of the farm poor by one dollar would be estimated at $1000, not a very satisfactory ratio. There are of course many other beneficiaries

9 (cont.)
than the farm poor and other program objectives besides increasing family incomes. The problem of allocating costs to different program objectives in multi-objective programs is difficult to handle and has been discussed elsewhere [see, for example, 9].

REFERENCES

[1] Aaron, Henry, "The Foundations of the 'War on Poverty' Reexamined" Amer. Econ. Rev. 57:1229-40, December 1967.

[2] Anderson, W.H. Locke, "Trickling Down: The Relationship Between Economic Growth and the Extent of Poverty Among American Families" Quart. J. Econ., 77:511-524, November 1964.

[3] Berry, Brian J.L. with Peter G. Goheen and Harold Goldstein, Metropolitan Area Definition: A Reevaluation of Concept and Statistical Practice, U.S. Bureau of the Census Working Paper 28, Washington, D.C.: U.S. Bureau of Census, 1969.

[4] Bull, Leonard and William Saupe, Appraisal of Economic Climate and Agricultural Adjustment: Economic Adjustment Survey, Rural Wisconsin Households--1967, Users Guide and Tape File, Madison: University of Wisconsin Cooperative Extension Programs, University Extension, December, 1970.

[5] Chase, Richard X., "Structural and Aggregative Emphases in Anti-Poverty Policy," Amer. J. Econ. Soc. 27:9-27, January 1968.

[6] _____, "Unrelated Individuals: A 'Backwash' Poverty Population" Amer. J. Econ. Soc. 27(4):337-45, October 1968.

[7] _____ and G. Laber, "Economic Growth as an Anti-Poverty Tool: A Further Consideration of the Backwash Debate," Soc. Sci. Quart., 50(3):604-608, December 1969.

[8] Cohen, Malcolm S., Samuel A. Rea, Jr. and Robert I. Lerman, A Micro Model of Labor Supply, Bureau of Labor Statistics Staff Paper 4, Washington, D.C.: U.S. Government Printing Office, 1970.

[9] Freeman, A. Myrick III, "Project Design and Evaluation with Multiple Objectives;" The Analysis and Evaluation of Public Expenditures: The PPB System, U.S. Congress Joint Economic Committee, 91st Congress, 1969, pp. 565-578.

[10] Madden, J. Patrick, "Poverty Projections in Relation to Aggregate Demand, Economic Growth and Unemployment" Ch. 30 in President's National Advisory Commission on Rural Poverty, Rural Poverty in the United States, Washington, D.C.:U.S. Government Printing Office.

[11] Mooney, J.D., "Urban Poverty and Labor Force Participation," Amer. Econ. Rev. LVII (1):104-119, March 1967.

[12] Perl, L.J. and L.M. Solnick, "A Note on 'Trickling Down'," Quart. J. Econ. 85(1):171-78, February 1971.

[13] President's National Advisory Commission on Rural Poverty, The People Left Behind, Washington, D.C.:U.S. Government Printing Office, 1967.

[14] Sales Management, Survey of Buying Power 1965, New York: Sales Management, Inc., June 10, 1966.

[15] Sales Management, Survey of Buying Power 1967, New York: Sales Management, Inc., June 10, 1968.

[16] Saupe, William E. and Bruce A. Weber, "Rural Family Income in Wisconsin" Institute for Research on Poverty Discussion Paper 187-73, University of Wisconsin Madison, December 1973.

[17] Tweeten, Luther, "Systems Planning for Rural Development," Journal Article 2253 of the Agricultural Experiment Station, Oklahoma State University, Stillwater, March 1971.

[18] U.S. Bureau of the Census, Census of Population 1970 General Social and Economic Characteristics, Final Report PC(1)-C1 United States Summary, Washington, D.C.:U.S. Government Printing Office, 1972.

[19] U.S. Bureau of the Census, Census of Population 1970. General, Social and Economic Characteristics Final Report PC (1)-C51, Wisconsin, U.S. Government Printing Office: 1972, Tables 135-137.

[20] U.S. Bureau of the Census, County Business Patterns, 1966 (Illinois, Iowa, Minnesota, Wisconsin) Wisconsin: U.S. Government Printing Office, 1967.

[21] _____, County Business Patterns, 1968, (Wisconsin, Minnesota, Illinois, Iowa) Wisconsin: U.S. Government Printing Office, 1969.

[22] U.S. Department of Commerce, Economic Development Administration's Public Works Program: An Evaluation, Vol. 1, Washington, D.C.: U.S. Department of Commerce, July 1970.

[23] Upper Great Lakes Regional Commission, Regional Economic Development Plan and Five-Year Program (Final Draft), Washington, D.C.: Upper Great Lakes Regional Commission, December 1970.

[24] Weber, Bruce A., "Trickling Down: The Responsiveness of Rural and Rural Poor Family Income and Labor Supply to Regional Economic Growth," Unpublished Ph.D. Dissertation, University of Wisconsin, 1973.